Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1. (original): A method of reducing the rate of hematopoietic cell multiplication, comprising administering an effective amount of a CXCR4 agonist to the hematopoietic cells.

2. (original): The method of claim 1 wherein the hematopoietic cells are selected from the group consisting of hematopoietic stem cells and hematopoietic progenitor cells.

3. (original): The method of claim 1, wherein the cells are *in vivo* in a patient and a therapeutically effective amount of the CXCR4 agonist is adminstered to the patient in need of such treatment.

4. (original): The method of claim 3, wherein the patient has a cancer.

5. (original): The method of claim 3, wherein the patient requires autologous or allogeneic bone marrow or peripheral blood stem cell transplantation.

6. (original): The method of claim 3, further comprising treating the patient with a cytotoxic agent, wherein the effective amount of the CXCR4 agonist is sufficient to reduce the susceptibility of the cells to the cytotoxic agent.

7. (original): The method of claim 1, wherein the CXCR4 agonist comprises a peptide.

8. (original): The method of claim 7, wherein the peptide is selected from the group consisting of peptides having sequence of:
KPVSLSYRCPCRFFESHVARANVKHLKILNTPNCALQIVARLKNNNRQVCIDPKLKWIQ EYLEKALN (SEQ ID NO:1); KPVSLSYRCPCRFFESH (SEQ ID NO:4); KPVSLSYRC (SEQ ID NO:6); (SEQ ID NO:8) KPVSLSYRC-X-CRYSLSVPK (SEQ ID NO:9); KPVSLSYR (SEQ ID NO:11); (SEQ ID NO:10) KPVSLSYR-X-RYSLSVPK (SEQ ID NO:11); KPVSLSYRCPCRFFGGGGLKWIQEYLEKALN (SEQ ID NO:13); CCFSYTSRQIPQNFIADYFETSSQCSKPGVIFLTKRSRQV (SEQ ID NO:33); KPVSLSYRCPCRFFGGGGSKPGVIFLTKRSRQV (SEQ ID NO:34).

9. (original): The method of claim 1, wherein the CXCR4 agonist is a peptide comprising:

a) an N-terminal sequence homologous to an SDF-1 N-terminal sequence;

b) a C-terminal sequence homologous to an SDF-1 C-terminal sequence or to a MIP-1α sequence;

c) a peptide spacer sequence linking the N-terminal sequence to the C-terminal sequence, wherein the peptide spacer sequence linking the N-terminal sequence to the C-terminal comprises naturally-occurring amino acids, non-naturally-occurring amino acids, or both naturally-occurring amino acids and non-naturally-occurring amino acids.

10. (original): The method of claim 9, wherein the CXCR4 agonist comprises:
a) an internal cyclic amide bridge formed between a carboxylic acid side chain on a first amino acid residue and an amine side chain on a second amino acid residue.

11. (original): The method of claim 9, wherein the CXCR4 agonist comprises:
a) an internal cyclic disulphide or lactam bond between two amino acids.

12. (original): The method of claim 10, wherein the CXCR4 agonist, wherein the internal cyclic amide bridge is in the C-terminal sequence.

13. (original): The method of claim 7 wherein the peptide is selected from the group consisting of polypeptides having the sequence of:
a) KPVSL SYRCP CRFFE SHVAR ANVKH LKILN TPACA LQIVA RLKNN NRQVC IDPKL KWIQE YLEKA LN (SEQ ID NO:1);
b) MNAKV VVVLV LVLTA LCLSD GKPVS LSYRC PCRFF ESHVA RANVK HLKIL NTPNC ALQIV ARLKN NNRQV CIDPK LKWIQ EYLEK ALNKR FKM (SEQ ID NO:2); or,
c) MNAKV VVVLV LVLTA LCLSD GKPVS LSYRC PCRFF ESHVA RANVK HLKIL NTPNC ALQIV ARLKN NNRQV CIDPK LKWIQ EYLEK ALNKR FKM (SEQ ID NO:3).

14. (original): The method of claim 7, wherein the peptide is encoded by a nucleic acid that hybridizes under stringent conditions to a portion of a nucleic acid encoding SDF-1alpha, SDF-1beta or SDF-1 precursor.

15. (original): The method of claim 1, wherein the CXCR4 agonist is SDF-1.

16. (original): The method of claim 1, wherein the CXCR4 agonist is a peptide encoded by a nucleic acid, and the nucleic acid is used to transform the hematopietic cells so that the cells are capable of expressing the peptide.

17. (original): A method of reducing the susceptibility of hematopoietic cells to a cytotoxic agent, comprising administering an effective amount of a CXCR4 agonist to the hematopoietic cells prior to or during exposure of the cells to the cytotoxic agent.

18. (original): The method of claim 17 wherein the hematopoietic cells are selected from the group consisting of hematopoietic stem cells and hematopoietic progenitor cells.

19. (original): The method of claim 17, wherein the cells are *in vivo* in a patient and a therapeutically effective amount of the CXCR4 agonist is adminstered to the patient in need of such treatment.

20. (original): The method of claim 19, wherein the patient has a cancer.

21. (original): The method of claim 19, wherein the patient requires autologous or allogeneic bone marrow or peripheral blood stem cell transplantation.

22. (original): The method of claim 19 wherein the patient has an autoimmune disease.

23. (currently amended): A CXCR4 agonist peptide comprising:

a) a N-terminal sequence homologous to an SDF-1 N-terminal sequence;

b) a C-terminal sequence homologous to an SDF-1 C-terminal sequence ~~or to a MIP1 alpha sequence~~; and

c) a peptide spacer sequence linking the N-terminal sequence to the C-terminal sequence, wherein the peptide spacer sequence linking the N-terminal sequence to the C-terminal sequence comprises naturally-occurring amino acids, non-naturally-occurring amino acids, or both naturally-occurring amino acids and non-naturally-occurring amino acids.

24. (currently amended): The CXCR4 agonist of claim 23, further comprising ~~a)~~ an internal cyclic amide bridge formed between a carboxylic acid side chain on a first amino acid residue and an amine side chain on a second amino acid residue.

25. (currently amended) The CXCR4 agonist of claim 23, further comprising ~~a)~~ an internal cyclic disulphide or lactam bond between two amino acids.

26. (original): The CXCR4 agonist of claim 24, wherein the internal cyclic amide bridge is in the C-terminal sequence.

27. (new): The CXCR4 agonist of any one of claims 23 to 26 where the C- termini is an acid or an amide.

28. (new): The CXCR4 agonist peptide of any one of claims 23 to 27 wherein the peptide is selected from the group consisting of polypeptides having sequence of SEQ ID NO: 12 to 27.

29. (new): The CXCR4 agonist of claim 28 wherein the peptide is SEQ ID NO:13.